Subpart BB-Standards of Performance for Kraft Pulp Mills

Applicability - §60.280

Source	Requirement
General	1.) This subpart shall apply to the following facilities in kraft pulp mills: Digester system, brown stock washer system, multiple-effect evaporator system, recovery furnace, smelt dissolving tank, lime kiln, and condensate stripper system. 2.) Except as noted in §60.283(a)(1)(iv), any facility which begins construction or modification after September 24, 1976.
Combined with neutral sulfite semichemical pulping	Applicable when any portion of the material charged to a facility is produced by the kraft pulping operation.

Emission Standards

SOURCE	§60.283 TRS-(Total Reduced Sulfur)	§ 60.282 PM
Lime kiln	Facility shall not emit gases which contain TRS in excess of 8 ppm by volume on a dry basis, corrected to 10 percent oxygen.	1.) Facilities which burn gaseous fossil fuel shall not emit gases which contain particulate matter in excess of 0.15 g/dscm (0.067 gr/dscf) corrected to 10 percent oxygen. 2.) Facilities which burn liquid fossil fuel shall not emit gases which contain particulate matter in excess of 0.30 g/dscm (0.13 gr/dscf) corrected to 10 percent oxygen.
Recovery Furnace	1.) Straight kraft recovery furnace shall not emit gases which contain TRS > 5 ppm by volume on a dry basis, corrected to 8 percent oxygen. 2.) Cross recovery furnace shall not emit any gases which contain TRS in excess of 25 ppm by volume on a dry basis, corrected to 8 percent oxygen.	1.) Facility shall not emit gases > 0.10 g/dscm (0.044 gr/dscf) corrected to 8 percent oxygen. 2.) Facility shall not emit gases which exhibit 35% opacity or greater
Smelt Disovling Tank	Facility shall not emit gases which contain TRS in excess of 0.016 g/kg black liquor solids as H2S (0.033 lb/ton black liquor solids as H2S).	Facility shall not emit gases which contain particulate matter > 0.1 g/kg black liquor solids (dry weight)[0.2 lb/ton black liquor solids(dry weight)].

SOURCE	§60.283 TRS-(Total Reduced Sulfur)	§ 60.282 PM
Digester System, Brown Stock Washer System, Multiple-Effect Evaporator System, or Condensate Stripper System	Facility shall not emit any gases with TRS in excess of 5 ppm by volume on a dry basis, corrected to 10 percent oxygen, unless the following conditions are met: 1.) The gases are combusted in a lime kiln 2.) The gases are combusted in a recovery furnace 3.) The gases are combusted with other waste gases in an incinerator or other device, or combusted in a lime kiln or recovery furnace not subject to the provisions of this subpart, and are subjected to a minimum temperature of 1200° F. for at least 0.5 second; or 4.) It has been demonstrated to the Administrator's satisfaction by the owner or operator that incinerating the exhaust gases from a new, modified, or reconstructed brown stock washer system is technologically or economically unfeasible. Any exempt system must comply if the facility is changed so that the gases can be incinerated. 5.) The gases are controlled by a means other than combustion. The system shall not discharge any gases to the atmosphere which contain > 5 ppm by volume on a dry basis, corrected to the actual oxygen content of the untreated gas stream. 6.) The uncontrolled exhaust gases from a new, modified, or reconstructed digester system contain < 0.005 g/kg ADP (0.01 lb/ton ADP).	

Monitoring of emissions and operations - §60.284

Source	TRS	**PM**
General	The Administrator will not consider periods of excess emissions reported under paragraph (d) of this section to be indicative of a violation of §60.11(d) provided that: The Administrator determines that the affected facility, including air pollution control equipment, is maintained and operated in a manner which is consistent with good air pollution control practice for minimizing emissions during periods of excess emissions.	
	Facility shall comply with the following, except where the provisions of §60.283 (a)(1)(iv) or (a)(4) apply. 1.) Calculate and record on a daily basis 12-hour average TRS concentrations for the two consecutive periods of each operating day. Each 12-hour average shall be determined as the arithmetic mean of the appropriate 12 contiguous 1-hour average total reduced sulfur concentrations provided by each continuous monitoring system installed under paragraph (a)(2) of this section. 2.) Calculate and record on a daily basis 12-hour average oxygen concentrations for the two consecutive periods of each operating day for the recovery furnace and lime kiln. These 12-hour averages shall correspond to the 12-hour average TRS concentrations under paragraph (c)(1) of this section and shall be determined as an arithmetic mean of the appropriate 12 contiguous 1-hour average oxygen concentrations provided by each continuous monitoring system installed under paragraph (a)(2) of this section. 3.) Correct all 12-hour average TRS concentrations to 10 volume percent oxygen, except that all 12-hour average TRS concentration from a recovery furnace shall be corrected to 8 volume percent using the following equation: Ccorr=CmeasX(21-X/21-Y) 4.) Record once per shift measurements obtained from the continuous monitoring devices installed under paragraph (b)(2) of this section.	
Recovery Furnace		Facility shall install, calibrate, maintain, and operate the following continuous monitoring systems: 1.) Monitor and record the opacity of the gases discharged into the atmosphere. 2.) The span of this system shall be set at 70 percent opacity.

Source	TRS	**PM**
Lime Kiln, Recovery Furnace, Digester System, Brown Stock Washer System, Multiple-Effect Evaporator System, or Condensate Stripper System, except where the provisions of §60.283(a)(1) (iii) or (iv) apply.	Facility shall install, calibrate, maintain, and operate the following continuous monitoring systems: 1.) Continuous monitoring systems to monitor and record the concentration of TRS emissions on a dry basis and the percent of oxygen by volume on a dry basis in the gases discharged into the atmosphere 2.) These systems shall be located downstream of the control device(s) and the spans of these continuous monitoring system(s) shall be set: **a.)** At a TRS concentration of 30 ppm for the TRS continuous monitoring system, except that for any cross recovery furnace the span shall be set at 50 ppm. b.) At 20 percent oxygen for the continuous oxygen monitoring system.	
For any incinerator, which emits gas from any digester system, brown stock washer system, multiple-effect evaporator system, black liquor oxidation system, or condensate stripper system where the provisions of §60.283(a)(1)(iii) apply.	Facility shall install, calibrate, maintain, and operate the following continuous monitoring devices: 1.) A monitoring device which measures and records the combustion temperature at the point of incineration of effluent gases 2.) The monitoring device is to be certified by the manufacturer to be accurate within ±1 percent of the temperature being measured.	
For any lime kiln or smelt dissolving tank using a scrubber emission control device	Facility shall install, calibrate, maintain, and operate the following continuous monitoring devices: 1.) A monitoring device for the continuous measurement of the pressure loss of the gas stream through the control equipment. The monitoring device is to be certified by the manufacturer to be accurate to within a gage pressure of ±500 pascals (ca. ±2 inches water gage pressure). 2.) A monitoring device for the continuous measurement of the scrubbing liquid supply pressure to the control equipment. The monitoring device is to be certified by the manufacturer to be accurate within ±15 percent of design scrubbing liquid supply pressure. The pressure sensor or tap is to be located close to the scrubber liquid discharge point. The Administrator may be consulted for approval of alternative locations.	

Source	TRS	PM
Recovery Furnace	1.) Facility shall report semiannually periods of excess emissions for all 12-hour averages of TRS concentrations above 5 ppm by volume for straight kraft recovery furnaces and above 25 ppm by volume for cross recovery furnaces. 2.) The Administrator will not consider periods of excess emissions reported under paragraph (d) of this section to be indicative of a violation of §60.11(d) provided that: a.) The percent of the total number of possible contiguous periods of excess emissions in a quarter (excluding periods of startup, shutdown, or malfunction and periods when the facility is not operating) during which excess emissions occur does not exceed One percent for TRS emissions.	1.) Facility shall report semiannually periods of excess emissions for all 6-minute average opacities that exceed 35 percent. **2.)** The Administrator will not consider periods of excess emissions reported under paragraph (d) of this section to be indicative of a violation of §60.11(d) provided that: a.) The percent of the total number of possible contiguous periods of excess emissions in a quarter (excluding periods of startup, shutdown, or malfunction and periods when the facility is not operating) during which excess emissions occur does not exceed Six percent for average opacities.
Lime kiln	Facility shall report semiannually periods of excess emissions for Periods of excess emissions. Excess emissions are all 12-hour average TRS concentration above 8 ppm by volume.	
Digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system	Facilitty shall report semiannually periods of excess emissions as follows: 1.) All 12-hour average TRS concentrations above 5 ppm by volume unless the provisions of §60.283(a)(1) (i), (ii), or (iv) apply; or 2.) All periods in excess of 5 minutes and their duration during which the combustion temperature at the point of incineration is less than 1200 °F, where the provisions of §60.283(a)(1)(iii) apply.	

Test methods and procedures - §60.285

Source	TRS Facilities	PM Facilities
General	Facility may use the following as alternatives to the reference methods and procedures specified in this section: 1.) For Method 5, Method 17 may be used if a constant value of 0.009 g/dscm (0.004 gr/dscf) is added to the results of Method 17 and the stack temperature is no greater than 205 °C (400 °F). 2.) For Method 16, Method 16A or 16B may be used if the sampling time is 60 minutes.	
Cross recovery furnaces, Straight kraft recovery furnaces, and lime kilns	Facility shall determine compliance with the TRS standards as follows: 1.) Method 16 shall be used to determine the TRS concentration. The TRS concentration shall be corrected to the appropriate oxygen concentration using the procedure in §60.284(c)(3). The sampling time shall be at least 3 hours, but no longer than 6 hours. 2.) The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the oxygen concentration. The sample shall be taken over the same time period as the TRS samples. 3.) When determining whether a furnace is a straight kraft recovery furnace or a cross recovery furnace, TAPPI Method T.624 (incorporated by reference-see §60.17) shall be used to determine sodium sulfide, sodium hydroxide, and sodium carbonate. These determinations shall be made 3 times daily from the green liquor, and the daily average values shall be converted to sodium oxide (Na20) and substituted into the following equation to determine the green liquor sulfidity: GLS = 100 CNa2S/(CNA2S+CNa2H+CNa2CO3)	Facility shall determine compliance with the particulate matter standards as follows: 1.) Method 5 shall be used to determine the particulate matter concentration. The sampling time and sample volume for each run shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Water shall be used as the cleanup solvent instead of acetone in the sample recovery procedure. The particulate concentration shall be corrected to the appropriate oxygen concentration according to §60.284(c)(3). 2.) The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the oxygen concentration. The gas sample shall be taken at the same time and at the same traverse points as the particulate sample. 3.) Method 9 and the procedures in §60.11 shall be used to determine opacity.
Digester system, brown stock washer system, multiple-effect evaporator system, or condensate stripper system or smelt dissolving tank	Facility shall determine compliance with the TRS standards as follows: 1.) The emission rate (E) of TRS shall be computed for each run using the following equation: E=CTRS F Qsd/P 2.) Method 16 shall be used to determine the TRS concentration (CTRS) 3.) Method 2 shall be used to determine the volumetric flow rate (Qsd) of the effluent gas. 4.) Process data shall be used to determine the black liquor feed rate or the pulp production rate (P).	Facility shall determine compliance with the particular matter standard as follows: 1.) The emission rate (E) of particulate matter shall be computed for each run using the following equation: E=cs Qsd/BLS 2.) Method 5 shall be used to determine the particulate matter concentration (cs) and the volumetric flow rate (Qsd) of the effluent gas. The sampling time and sample volume shall be at least 60 minutes and 0.90 dscm (31.8 dscf). Water shall be used instead of acetone in the sample recovery. 3.) Process data shall be used to determine the black liquor solids (BLS) feed rate on a dry weight basis.